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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/039,005 | 12/31/2001 | In San Jeon | 51876P290 | 7498 |
| 8791 | 7590 | 07/01/2004 | EXAMINER | |
| BLAKELY SOKOLOFF TAYLOR & ZAFMAN 12400 WILSHIRE BOULEVARD, SEVENTH FLOOR LOS ANGELES, CA 90025 | | | ABRAHAM, ESAW T | |
| | | ART UNIT | | PAPER NUMBER |
| | | 2133 | | |

DATE MAILED: 07/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|----------------------------|------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/039,005 | JEON ET AL. | |
| | Examiner Esaw T Abraham | Art Unit 2133 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 31 December 2001.
 2a) This action is **FINAL**. 2b) This action is non-final.
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-10 is/are pending in the application.
 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
 5) Claim(s) _____ is/are allowed.
 6) Claim(s) 1-10 is/are rejected.
 7) Claim(s) _____ is/are objected to.
 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.
 10) The drawing(s) filed on 31 December 2001 is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date 01/27/04.

4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____.
 5) Notice of Informal Patent Application (PTO-152)
 6) Other: _____.

DETAILED ACTION

1. Claims **1-10** are presented for examination.

Priority

2. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

Information Disclosure Statement

3. The examiner has been considered the references listed in the information disclosure statement submitted on 01/27/04.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims **2, 3 and 10**, are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a) Regarding to claim 2 the phrase "**in case an input I is 0 and I is 1**" (see line 24 of claim 2) renders the claim indefinite because it is unclear to the examiner what the applicant meant and how the claim language is related to the forward state metric calculation. The examiner would appreciate if the applicant would clarify this matter.

b) Regarding to claim 3 the phrase "**in case an input I is 0 and the input I is 1**" (see line 6 of claim 3) renders the claim indefinite because it is unclear to the examiner what the applicant meant and how the claim language is related to the forward state metric calculation. The examiner would appreciate if the applicant would clarify this matter.

Regarding to claim 10 the phrase “**in case an input I is 0 and the input I is 1**” (see line 5 of claim 10) renders the claim indefinite because it is unclear to the examiner what the applicant meant and how the claim language is related to the forward state metric calculation. The examiner would appreciate if the applicant would clarify this matter.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

5. Claims **1-10** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lerzer (U.S. PN: 6,343,368).

As per claims **1, 3 and 10**, Lerzer teaches or discloses an error correction codes using maximum a posteriori (MAP) decoding technique (see col. 1, lines 15-17). Lerzer in figure 6 teaches a branch metric calculation unit (BTMC) (22) for calculating branch metric calculation

and for receiving symbols (see the inputs coupled to the BTMC unit), a state metric calculation unit (RSMC) (82) for calculating a reverse state metric and storing the branch metric in a storage unit (RSM) (38), and a log likelihood ratio calculation unit (LRC) (28) for calculating likelihood ratio by receiving the forward state metric and reading the reverse state metric saved at the storage unit (38). Lerzer **does not explicitly teach** a turbo decoding. However, Lerzer teaches that the processes described above may be used to decode turbo coded received signal sequences, wherein the likelihood ratios are calculated for a sequence prior to any hard decisions being made regarding received symbol values (see col. 11, lines 9-20). **Therefore**, it would have been obvious to a person having an ordinary skill in the art at the time the invention was made to perform turbo decoding in the system of Lerzer as taught by Lerzer. **This modification** would have been obvious because a person having ordinary skill in the art would have been motivated to do so because turbo code decoding is known in the art to be implemented in a MAP (maximum posteriori probability) to generate a posteriori probability estimates of the information bits that have been encoded into the code word.

As per claim 2, Lerzer teaches all the subject matter claimed in claim 1 including a forward and reverse state metric calculations according to branch metrics (see claim 1).

As per claims **4 and 7**, Lerzer teaches all the subject matter claimed in claim 3 including Lerzer teaches four steps; for example one of the steps is reverse state metric calculations of MAP log algorithm including equations for calculating the reverse state metric (see col. 5, lines 20-27) and further Lerzer teaches BTMC unit supplies a branch transition metric to the FSMC (forward state metric) unit and the RSMC (reverse state metric) unit and the inputs to the single BTMC will also need to switch between those needed to calculate the branch metrics from the

beginning of the sequence trellis and those needed to calculate the branch metrics from the end of the sequence trellis (see col. 9 last paragraph).

As per claims **5 and 8**, Lerzer teaches all the subject matter claimed in claim 3 including Lerzer teaches four steps; for example one of the steps is forward state metric calculations of MAP log algorithm including equations for calculating the forward state metric (see col. 5, lines 10-17) and further Lerzer teaches BTMC unit supplies a branch transition metric to the FSMC (forward state metric) unit and the RSMC (reverse state metric) unit and the inputs to the single BTMC will also need to switch between those needed to calculate the branch metrics from the beginning of the sequence trellis and those needed to calculate the branch metrics from the end of the sequence trellis (see col. 9 last paragraph).

As per claims **6 and 9**, Lerzer teaches all the subject matter claimed in claim 3 including Lerzer teaches four steps; for example one of the steps is likelihood ratio calculations of MAP log algorithm including equations for calculating likelihood ratio (see col.5, lines 30-45) and further Lerzer teaches BTMC unit supplies a branch transition metric to the FSMC (forward state metric) unit and the RSMC (reverse state metric) unit and the inputs to the single BTMC will also need to switch between those needed to calculate the branch metrics from the beginning of the sequence trellis and those needed to calculate the branch metrics from the end of the sequence trellis (see col. 9 last paragraph).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US PN: 6,434,203 Halter

US PN: 6,658,071 Cheng

US PN: 6,381,728 Kang

7. Any inquiry concerning this communication or earlier communication from the examiner should be directed to Esaw Abraham whose telephone number is (703) 305-7743. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are successful, the examiner's supervisor, Albert DeCady can be reached on (703) 305-9595. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Esaw Abraham
Esaw Abraham

Art unit: 2133

*Gray J. Lamarr
for*

Albert DeCady
Primary Examiner